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Ontario

# Clearing the air on smog

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## What is smog?

The term smog comes from the words “smoke” and “fog”, and refers to the brownish-yellow haze we can sometimes see blanketing the horizon in warmer months.

Although smog contains a mixture of contaminants, one of the most toxic components is ground-level ozone. We’ve all heard of ozone in the upper atmosphere, where it actually protects the earth from the sun’s harmful ultraviolet rays.

However, at ground level, where humans live and breathe, ozone is toxic and irritates mucous membranes.

## Where does smog come from?

Ground-level ozone is formed when two primary pollutants, nitrogen oxides ( $\text{NO}_x$ ) and volatile organic compounds (VOCs), react in the presence of sunlight.

Cars, trucks, power plants and manufacturing industries burn fossil fuels to produce  $\text{NO}_x$ . In Ontario, motor vehicles are the largest single source of  $\text{NO}_x$  emissions.

Although VOCs occur naturally in the atmosphere, some result from human activity. Most VOCs are released into the air from the evaporation of gasoline, oil-based paints and cleaning solvents. VOCs also come from transportation activities like automobile exhaust, or even from dry cleaning. In urban areas across Canada, automobiles are the most significant source of VOCs.

## Effects on health

Smog can be irritating to the eyes, nose and throat after only a few hours of exposure. Some people may start to cough or have difficulty breathing. Although these outward symptoms usually disappear, if repeated exposure occurs, lungs suffer premature aging.

When air quality is poor, anyone may feel the effects of ozone exposure. However, some groups of people are especially sensitive. Children, the elderly, and people with asthma or other respiratory conditions are more susceptible to the effects of smog, as are people who work or exercise outdoors.

## Effects on vegetation

Humans are not the only organisms to suffer from the ill-effects of ozone. Ozone can seriously damage our crops and forests as well. It acts by attacking the foliage of plants, reducing growth and crop yield.







## CONTRIBUTING FACTORS TO SMOG

### Weather and geographical conditions

In most cases, sunlight and heat are the two main weather conditions contributing to smog formation. However, rain and wind can also affect smog levels. Smog usually reaches high levels when winds are low, temperatures are high and there is no cloud cover. These weather conditions are associated with slow-moving weather patterns that allow air pollutants to build up. Rain showers can wash the air of pollutants that cause smog. However, this may result in acid rain.

### Transboundary air pollution

Wind also carries air pollution over great distances, sometimes from as far away as the mid-western United States. Smog often moves from urban centres like Toronto to rural communities close-by.

Smog can be imported over the Canada/U.S. border. This is called transboundary air pollution. Smog concentrations are particularly pronounced along the U.S. border and near the shores of the Great Lakes. In fact, more than half of the ground-level ozone over Ontario originates from transboundary emissions.

## WORKING TOGETHER TO REDUCE SMOG

### The Canadian Council of Ministers of the Environment (CCME)

The Canadian Council of Ministers of the Environment (CCME) is the major intergovernmental forum in Canada for discussion and action on environmental issues of national and global concern.

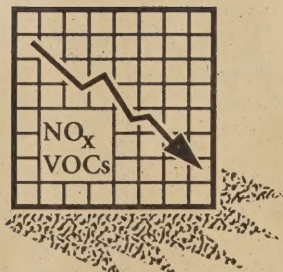
CCME is made up of environment ministers from each of the ten provinces, the two territories and the federal government. Its work is aimed at developing a consistent and coordinated approach among governments to solve environmental problems.

### The CCME NO<sub>x</sub>/VOCs Management Plan

Recognizing the seriousness of the smog problem in Canada, the CCME developed a plan for the management of NO<sub>x</sub> and VOCs.

The plan's overall goal is to meet Canada's Maximum Acceptable Air Quality Objective for ground-level ozone in all areas of the country by the year 2005. The Ontario criterion is 80 parts per billion — one of the most stringent in the world.

Ontario is working towards a 25 per cent reduction in NO<sub>x</sub>/VOC emissions from 1985 levels in the Southern Ontario Corridor by the year 2005, in keeping with CCME's NO<sub>x</sub>/VOC Management Plan.







## Across Ontario

The Southern Ontario Corridor is Canada's worst area for smog. Acceptable levels for ozone are exceeded here more often, for longer periods of time and at higher concentrations than anywhere else in the country. The Ontario portion of the Southern Ontario Corridor encompasses everything south of the line between Grand Bend on Lake Huron and Arnprior on the Ottawa River. The region from Windsor to Toronto experiences particularly high ozone levels, partly because of air pollution from neighbouring U.S. sources.

Ontario has announced a number of Clearing the Air initiatives as part of its approach to smog reduction, including:

- a regulation restricting the volatility of gasoline during the summer months;
- an Ontario Hydro commitment to reduce 1985  $\text{NO}_x$  emissions by at least 40 per cent by the year 2000 (in 1994, Ontario Hydro achieved more than a 40 per cent reduction);
- voluntary pollution prevention Memoranda of Understanding with the Canadian Chemical Producers Association, the Motor Vehicle Manufacturers Association, and the Automotive Parts Manufacturers Association;
- transit, building code and taxation initiatives to reduce energy use and minimize energy-related emissions;
- a regulation requiring training for dry cleaners to minimize VOC emissions from dry cleaning chemicals;
- a regulation requiring installation of vapour recovery systems during gasoline distribution;
- emission limits for stationary combustion turbine engines;
- a vehicle inspection and maintenance pilot program to reduce vehicle emissions;
- a joint federal/provincial air quality advisory to warn the public of incidents of high ground-level ozone levels;
- a joint federal/provincial pilot project called "Green Clean" that will test a waterbased cleaning process as an alternative to the use of the chemical perchloroethylene (or perc) currently used by the dry cleaning industry.



## WHAT YOU CAN DO TO REDUCE SMOG

### Become travel smart

Walk, cycle, use public transportation or carpool whenever possible. One busload of passengers removes 40 vehicles from the road, saves 83,000 litres of fuel and avoids 11.5 tonnes of air pollutants a year.

Share rides. Two people in a vehicle cuts the fuel consumption per person in half.

Drive at moderate speeds. Optimum fuel economy for most vehicles is between 50 and 70 km/hr. Reducing speed from 100 to 80 km/hr reduces fuel consumption by 15 to 20 per cent.







Roll up your windows on the highway to avoid increased fuel consumption and wind resistance. Open vents instead for a breath of fresh air.

Keep your car well tuned by following the maintenance recommendations in your owner's manual. A poorly tuned engine can suck up to 10 per cent more fuel.

Check your tires regularly. Tire drag due to under-inflation increases fuel consumption by 4 to 8 per cent.

## Around the home

When renovating, think green. Energy-efficient windows, solar hot water systems and better weatherstripping and caulking will help you save energy, money and will help the environment.

Cool your home in summer with fans, an environmentally sound alternative to air conditioners. Using awnings and blinds helps reduce heat gain through windows. Trees planted on the south side of the house can also provide shade from the hot summer sun.

Switch to fluorescent or energy-saving incandescent light bulbs. This lighting helps reduce emissions that contribute to smog — particularly if electricity comes from coal or oil-burning stations.

Use an electric mower or, even better, a push mower instead of a gasoline-powered machine. Choose hand tools over power tools wherever reasonably possible for gardening and odd jobs.

Everyday items like oil-based paints, household cleaners and personal care products may contain VOC-emitting solvents. If you must use solvents, follow directions, use only what you need and dispose of them with care. Leftover paint should be taken to a household hazardous waste depot or given to someone who can use it. Some communities have paint recycling depots which take leftover paint, recycle it and put it back on the shelf.



## Shop wisely

Reducing energy and making wise buying decisions both contribute to cleaner air. The following tips should help you make smog-smart buying decisions when shopping:

When purchasing a home, choose an energy-efficient model like the R-2000 home.

Alternative fuels — propane and natural gas — are a good choice if available in your area. Ask your local gas utility or auto propane dealer for more information.

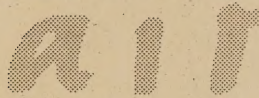
If you're buying a new car, a fuel-efficient model will reduce emissions by consuming less gas. Transport Canada and Natural Resources Canada publish a Fuel Consumption Guide every year which can be picked up at any provincial/territorial motor vehicle licence agency.

When choosing appliances, the most energy-efficient models can be selected with the help of the EnerGuide label — the lower the rating, the less energy that appliance uses. Choose fixtures that use less water in the kitchen, laundry and bathroom.





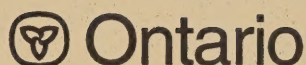
## CLEARING THE AIR



## OPÉRATION AIR PUR

Alternatives to solvent-rich products, such as water-based paints, have been available for some time and should be used instead. With the help of the EcoLogo, consumers can now choose paints and other products that are considered to have less environmental impact.

*This brochure is adapted from original material prepared by the NO<sub>x</sub>/VOC Office of the CCME.*



**For more information on specific Ontario Clearing the Air initiatives, please contact:**

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